查询HT7130供应商

HOLTEK

# HT71XX
# High Voltage Regulator

## Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- High input voltage (up to 24V)
- TO-92 and SOT-89 packages

## Applications

- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

## General Description

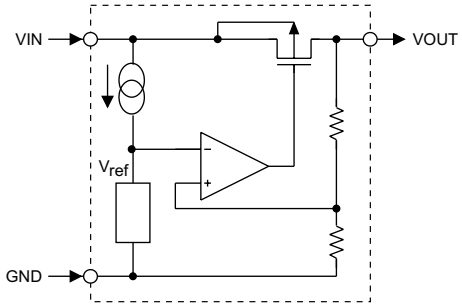
The HT71XX series is a set of three-terminal low power high voltage regulators implemented in CMOS technology. They allow input voltages as high as 24V. They are available with several fixed output voltages ranging from 3.0V to 5.0V. CMOS technology ensures low voltage drop and low quiescent current.

Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain variable voltages and currents.

## Selection Table

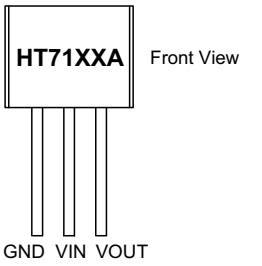
| Part No. | Output Voltage | Tolerance |
|---|---|---|
| HT7130 | 3.0V | ±5% |
| HT7133 | 3.3V | ±5% |
| HT7136 | 3.6V | ±5% |
| HT7144 | 4.4V | ±5% |
| HT7150 | 5.0V | ±5% |

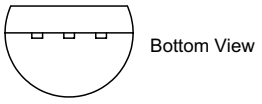
## Block Diagram



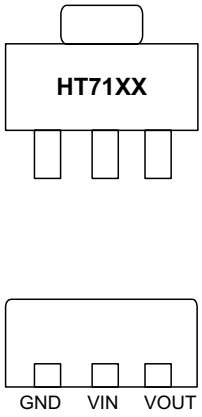

## Pin Assignment

**TO-92**

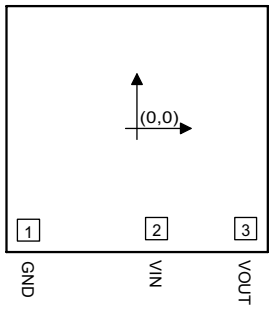



**SOT-89**




## Pad Assignment




Chip size: 1374×1294 $(\mu m)^2$

* The IC substrate should be connected to VDD in the PCB layout artwork.

## Pad Coordinates

Unit: μm

| Pad No. | X | Y |
|---|---|---|
| 1 | –480.00 | –451.50 |
| 2 | 87.50 | –444.50 |
| 3 | 482.00 | –444.50 |

## Absolute Maximum Ratings

Supply Voltage .....–0.3V to 28V
Power Consumption ..... 200mW
Storage Temperature .....–50°C to 125°C
Operating Temperature .....0°C to 70°C

Note: These are stress ratings only. Stresses exceeding the range specified under Absolute Maximum Ratings may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

## Electrical Characteristics

**HT7130, +3.0V output type** Ta=25°C

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| | | $V_{IN}$ | Conditions | | | | |
| $V_{OUT}$ | Output Voltage | 5V | $I_{OUT}$=10mA | 2.85 | 3.0 | 3.15 | V |
| $I_{OUT}$ | Output Current | 5V | — | 20 | 30 | — | mA |
| $\Delta V_{OUT}$ | Load Regulation | 5V | 1mA≤$I_{OUT}$≤20mA | — | 60 | 100 | mV |
| $V_{DIF}$ | Voltage Drop | — | $I_{OUT}$=1mA | — | 100 | — | mV |
| $I_{SS}$ | Current Consumption | 5V | No load | — | 4 | 6.0 | μA |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | Line Regulation | — | 4V≤$V_{IN}$≤24V<br>$I_{OUT}$=1mA | — | 0.2 | — | %/V |
| $V_{IN}$ | Input Voltage | — | — | — | — | 24 | V |
| $\frac{\Delta V_{OUT}}{\Delta T_a}$ | Temperature Coefficient | 5V | $I_{OUT}$=10mA<br>0°C<Ta<70°C | — | ±0.45 | — | mV/°C |

**HT7133, +3.3V output type** Ta=25°C

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| | | $V_{IN}$ | Conditions | | | | |
| $V_{OUT}$ | Output Voltage | 5.5V | $I_{OUT}$=10mA | 3.135 | 3.3 | 3.465 | V |
| $I_{OUT}$ | Output Current | 5.5V | — | 20 | 30 | — | mA |
| $\Delta V_{OUT}$ | Load Regulation | 5.5V | 1mA≤$I_{OUT}$≤30mA | — | 60 | 100 | mV |
| $V_{DIF}$ | Voltage Drop | — | $I_{OUT}$=1mA | — | 100 | — | mV |
| $I_{SS}$ | Current Consumption | 5.5V | No load | — | 4 | 6 | μA |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | Line Regulation | — | 4.5V≤$V_{IN}$≤24V<br>$I_{OUT}$=1mA | — | 0.2 | — | %/V |
| $V_{IN}$ | Input Voltage | — | — | — | — | 24 | V |
| $\frac{\Delta V_{OUT}}{\Delta T_a}$ | Temperature Coefficient | 5.5V | $I_{OUT}$=10mA<br>0°C<Ta<70°C | — | ±0.5 | — | mV/°C |

**HT7136, +3.6V output type** Ta=25°C

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| | | $V_{IN}$ | Conditions | | | | |
| $V_{OUT}$ | Output Voltage | 5.6V | $I_{OUT}$=10mA | 3.42 | 3.6 | 3.78 | V |
| $I_{OUT}$ | Output Current | 5.6V | — | 20 | 30 | — | mA |
| $\Delta V_{OUT}$ | Load Regulation | 5.6V | 1mA≤$I_{OUT}$≤30mA | — | 60 | 100 | mV |
| $V_{DIF}$ | Voltage Drop | — | $I_{OUT}$=1mA | — | 60 | — | mV |
| $I_{SS}$ | Current Consumption | 5.6V | No load | — | 3.0 | 7.0 | μA |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | Line Regulation | — | 4.6V≤$V_{IN}$≤12V<br>$I_{OUT}$=1mA | — | 0.2 | — | %/V |
| $V_{IN}$ | Input Voltage | — | — | — | — | 24 | V |
| $\frac{\Delta V_{OUT}}{\Delta T_a}$ | Temperature Coefficient | 5.6V | $I_{OUT}$=10mA<br>0°C<Ta<70°C | — | ±0.6 | — | mV/°C |

**HT7144, +4.4V output type** Ta=25°C

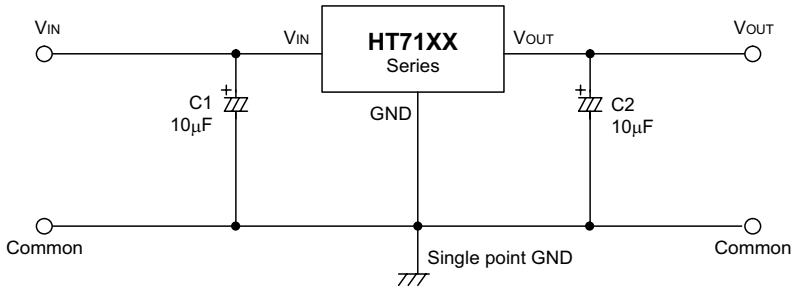
| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| | | $V_{IN}$ | Conditions | | | | |
| $V_{OUT}$ | Output Voltage | 6.4V | $I_{OUT}$=10mA | 4.18 | 4.4 | 4.62 | V |
| $I_{OUT}$ | Output Current | 6.4V | — | 20 | 30 | — | mA |
| $\Delta V_{OUT}$ | Load Regulation | 6.4V | 1mA≤$I_{OUT}$≤30mA | — | 60 | 100 | mV |
| $V_{DIF}$ | Voltage Drop | — | $I_{OUT}$=1mA | — | 100 | — | mV |
| $I_{SS}$ | Current Consumption | 6.4V | No load | — | 4 | 7.5 | μA |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | Line Regulation | — | 5.4V≤$V_{IN}$≤24V<br>$I_{OUT}$=1mA | — | 0.2 | — | %/V |
| $V_{IN}$ | Input Voltage | — | — | — | — | 24 | V |
| $\frac{\Delta V_{OUT}}{\Delta T_a}$ | Temperature Coefficient | 6.4V | $I_{OUT}$=10mA<br>0°C<Ta<70°C | — | ±0.7 | — | mV/°C |

**HT7150, +5.0V output type** Ta=25°C

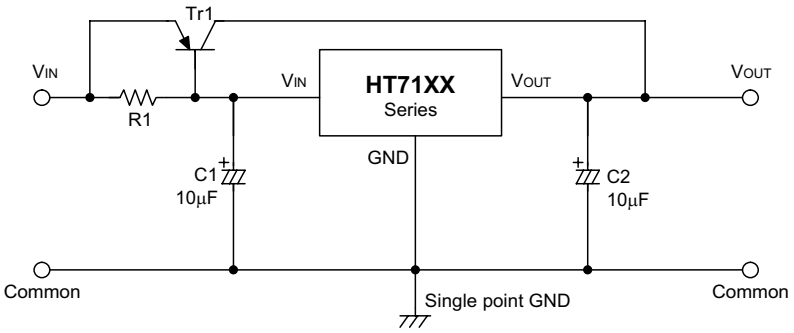
| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| | | $V_{IN}$ | Conditions | | | | |
| $V_{OUT}$ | Output Voltage | 7V | $I_{OUT}$=10mA | 4.75 | 5.0 | 5.25 | V |
| $I_{OUT}$ | Output Current | 7V | — | 20 | 30 | — | mA |
| $\Delta V_{OUT}$ | Load Regulation | 7V | 1mA≤$I_{OUT}$≤30mA | — | 60 | 100 | mV |
| $V_{DIF}$ | Voltage Drop | — | $I_{OUT}$=1mA | — | 100 | — | mV |
| $I_{SS}$ | Current Consumption | 7V | No load | — | 5 | 9 | μA |
| $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | Line Regulation | — | 6V≤$V_{IN}$≤24V<br>$I_{OUT}$=1mA | — | 0.2 | — | %/V |
| $V_{IN}$ | Input Voltage | — | — | — | — | 24 | V |
| $\frac{\Delta V_{OUT}}{\Delta T_a}$ | Temperature Coefficient | 7V | $I_{OUT}$=10mA<br>0°C<Ta<70°C | — | ±0.75 | — | mV/°C |

## Application Circuits

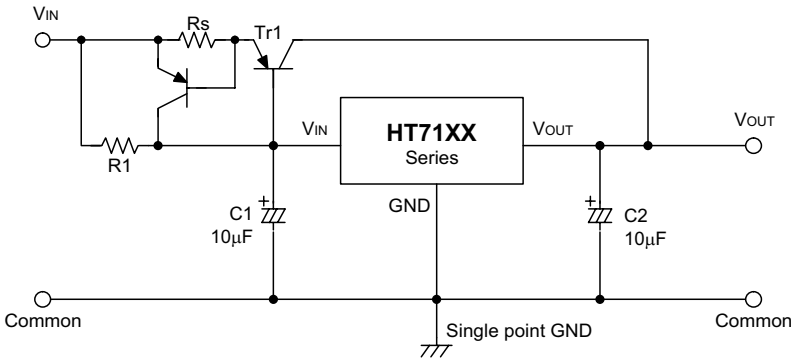
### Basic circuits



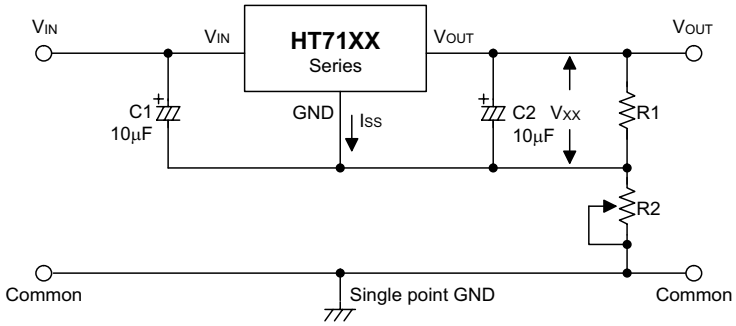
**High output current positive voltage regulator**




**Short-Circuit protection by Tr1**

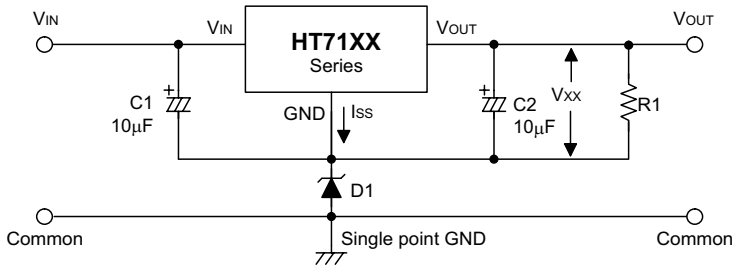



**Circuit for increasing output voltage**



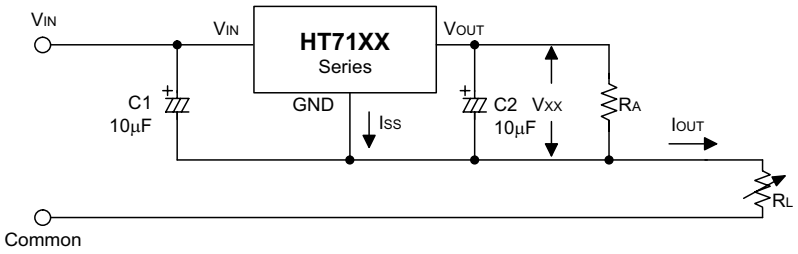

$$V_{OUT} = V_{XX}\ (1+\frac{R2}{R1}) + I_{SS}\ \ R2$$

### Circuit for increasing output voltage



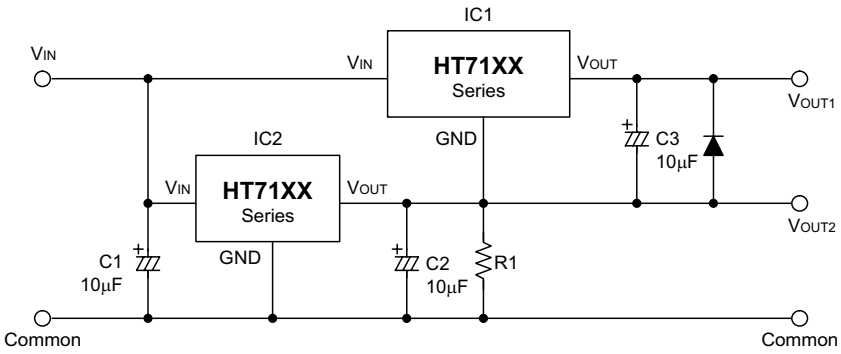

$$V_{OUT}=V_{XX}+V_{D1}$$

### Constant current regulator




$$I_{OUT}=\frac{V_{XX}}{R_A}+I_{SS}$$

### Dual supply



**Holtek Semiconductor Inc. (Headquarters)**
No.3 Creation Rd. II, Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.
Tel: 886-3-563-1999
Fax: 886-3-563-1189

**Holtek Semiconductor Inc. (Taipei Office)**
5F, No.576, Sec.7 Chung Hsiao E. Rd., Taipei, Taiwan, R.O.C.
Tel: 886-2-2782-9635
Fax: 886-2-2782-9636
Fax: 886-2-2782-7128 (International sales hotline)

**Holtek Semiconductor (Hong Kong) Ltd.**
RM.711, Tower 2, Cheung Sha Wan Plaza, 833 Cheung Sha Wan Rd., Kowloon, Hong Kong
Tel: 852-2-745-8288
Fax: 852-2-742-8657

Copyright © 2000 by HOLTEK SEMICONDUCTOR INC.

The information appearing in this Data Sheet is believed to be accurate at the time of publication. However, Holtek assumes no responsibility arising from the use of the specifications described. The applications mentioned herein are used solely for the purpose of illustration and Holtek makes no warranty or representation that such applications will be suitable without further modification, nor recommends the use of its products for application that may present a risk to human life due to malfunction or otherwise. Holtek reserves the right to alter its products without prior notification. For the most up-to-date information, please visit our web site at http://www.holtek.com.tw.